

IN THE CLAIMS:

This listing of claims replaces all prior versions, and listings, of claims in the application.

Listing of the Claims

1. (Currently Amended) A homogeneous catalyst ~~for the production of methanol from purified synthesis gas at low temperature and low pressure which comprises~~ comprising a transition metal capable of forming a transition metal complex with containing coordinating ligands, and an a metal alkoxide, wherein said homogeneous catalyst is dissolved in a methanol solvent system and said homogeneous catalyst is capable of producing methanol from synthesis gas, provided said ~~transition metal complex is not transition metal carbonyl~~ coordinating ligands are not all carbonyl, and the transition metal is selected from the group consisting of Cr, Mo, W, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Au, Zn, or Cd, or a combination thereof.

2. (Original) The homogenous catalyst of claim 1, wherein said coordinating ligands are selected from the group consisting of N-donor ligands, P-donor ligands, O-donor ligands, C-containing ligands, halogens and mixtures thereof.

3. (Currently Amended) The homogenous catalyst of claim 1, wherein ~~the catalyst components~~ said transition metal complex and said alkoxide are completely dissolved in the methanol solvent system to yield a homogeneous liquid solution.

4. (Currently Amended) The homogenous catalyst of claim 1, wherein said ~~purified synthesis gas comprises CO₂, CO, or H₂~~ CO and H₂.

5-6 (Cancelled)

7. (Currently Amended) The homogenous catalyst of claim 1, wherein said transition metal is selected from the group consisting of Ni, Pd, Mo, ~~Cu~~, Ru, Fe and mixtures thereof.

8. (Currently Amended) The homogenous catalyst of claim 1, wherein said coordinating ligands are selected from the group consisting of chloride, acetylacetonate, 2,2-dipyridyl, bis(cyclooctadiene), 1,10-phenanthroline, 1,2-bis(diphenylphosphinoethane) and mixtures thereof.
9. (Currently Amended) The homogenous catalyst of claim 1, wherein the metal in said metal alkoxide ~~comprises a metal~~ is selected from alkali metals or alkaline earth metals.
10. (Currently Amended) The homogenous catalyst of claim 1, wherein the alkoxide in said metal alkoxide is derived from C₁₋₆ alcohols, C₂₋₂₀ glycols, or C₂₋₂₀ monoglycol ethers.
11. (Currently Amended) The homogenous catalyst of claim ~~1-9~~, wherein said metal of said metal alkoxide is potassium or sodium.
12. (Currently Amended) The homogenous catalyst of claim ~~1-11~~, wherein said metal alkoxide is potassium methoxide or sodium methoxide.
13. (Currently Amended) The homogenous catalyst of claim 1, wherein said methanol solvent system is methanol.
14. (Currently Amended) The homogenous catalyst of claim 13, wherein said methanol solvent system further ~~comprise~~ comprises a co-solvent selected from the group consisting of glymes, glycols, monoglycol ethers, amino solvents, other oxygenated solvents and mixtures thereof.
15. (Original) The homogenous catalyst of claim 14, wherein said co-solvent is selected from the group consisting of triglyme, tetrahydrofuran, dioxane, polyethylene glycol, derivatives of polyethylene glycol and mixtures thereof.
16. (Cancelled)

17. (Currently Amended) The homogenous catalyst of claim ~~16~~ 1, ~~wherein said further comprising a co-catalyst is a metal~~ selected from the group consisting of Cr, Mo, W, Co, Ni, Fe, ~~Cu~~, Ru, Rh, Pd, Pt and mixtures thereof.

18. (Currently Amended) A heterogeneous catalyst system comprising the catalyst of claim 1 and bound to a support therefor.

19. (Currently Amended) The heterogeneous catalyst system of claim 18, wherein said support is selected from the group consisting of zeolites, clays, acidic zeolites, alumina, silica and mixtures thereof.

20. (Currently Amended) A homogeneous catalyst for the production of methanol from synthesis gas at low temperature and low pressure, said homogeneous catalyst produced by reacting a transition metal complex having coordinating ligands selected from the group consisting of N-donor ligands, P-donor ligands, O-donor ligands, C-donor ligands, halogens and mixtures thereof or precursors thereof with an a metal alkoxide in a methanol solvent system over a temperature range and pressure range over a period of time effective to form said catalyst, provided at least one C-donor ligand is not carbonyl, wherein said homogeneous catalyst is dissolved in a methanol solvent system, provided said coordinating ligands are not all carbonyl, and the transition metal is selected from the group consisting of Cr, Mo, W, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Au, Zn, or Cd, or a combination thereof.

21. (Currently Amended) The homogenous catalyst of claim ~~20~~ 1, wherein said catalyst is capable of producing methanol from synthesis gas at a temperature range is from of about room temperature to about 150°C and said at a pressure range is from of about 1500 psig to about 70 psig.

22. (Currently Amended) The homogenous catalyst of claim 21, wherein said catalyst is capable of producing methanol from synthesis gas in a period of time ranges from of about ~~1 min in to about 30 min~~ one minute to about thirty minutes.

23-41. (Cancelled)

42. (New) The homogeneous catalyst of claim 4, wherein said synthesis gas further comprises CO₂.

43. (New) A homogeneous catalyst consisting of a transition metal complex containing coordinating ligands, and an alkoxide, wherein said catalyst is dissolved in a methanol solvent system and said catalyst is capable of producing methanol from synthesis gas, provided said coordinating ligands are not all carbonyl.